



## Modeling increased demand of energy for air conditioners and consequent CO(2) emissions to minimize health risks due to climate change in India

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### Abstract:

Developing countries situated mostly in latitudes that are projected for the highest climate change impact in the twenty-first century will also have a predictable increase in demand on energy sources. India presents us with a unique opportunity to study this phenomenon in a large developing country. This study finds that climate adaptation policies of India should consider the significance of air conditioners (A/Cs) in mitigation of human vulnerability due to unpredictable weather events such as heat waves. However, the energy demand due to air conditioning usage alone will be in the range of an extra similar to 750,000 GWh to similar to 1,350,000 GWh with a 3.7 degrees C increase in surface temperatures under different population scenarios and increasing incomes by the year 2100. We project that residential A/C usage by 2100 will result in CO(2) emissions of 592 Tg to 1064 Tg. This is significant given that India's total contribution to global CO(2) emissions in 2009 was measured at 1670 Tg and country's residential and commercial electricity consumption in 2007 was estimated at 145,000 GWh. (C) 2010 Published by Elsevier Ltd.

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### Resource Description

#### Climate Scenario :

specification of climate scenario (set of assumptions about future states related to climate)

Special Report on Emissions Scenarios (SRES)

**Special Report on Emissions Scenarios (SRES) Scenario:** SRES A1, SRES B1, SRES B2

#### Exposure :

weather or climate related pathway by which climate change affects health

Temperature, Unspecified Exposure

**Temperature:** Extreme Heat, Fluctuations

#### Geographic Feature:

resource focuses on specific type of geography

General Geographical Feature

#### Geographic Location:

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resource focuses on specific location

Non-United States

**Non-United States:** Asia

**Asian Region/Country:** India

**Health Co-Benefit/Co-Harm (Adaption/Mitigation):**

specification of beneficial or harmful impacts to health resulting from efforts to reduce or cope with greenhouse gases

A focus of content

**Health Impact:**

specification of health effect or disease related to climate change exposure

Morbidity/Mortality

**Mitigation/Adaptation:**

mitigation or adaptation strategy is a focus of resource

Adaptation, Mitigation

**Model/Methodology:**

type of model used or methodology development is a focus of resource

Cost/Economic, Exposure Change Prediction, Other Projection Model/Methodology

**Other Projection Model/Methodology:** GHG emissions

**Population of Concern:** A focus of content

**Population of Concern:**

populations at particular risk or vulnerability to climate change impacts

Elderly

**Resource Type:**

format or standard characteristic of resource

Research Article

**Socioeconomic Scenario:** Other Socioeconomic Scenario

**Other Socioeconomic Scenario:** GDP growth model

**Timescale:**

time period studied

Long-Term (>50 years)

**Vulnerability/Impact Assessment:**

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resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content